



PATENT Customer No. 22,852 Attorney Docket No. 03806.0586

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re A	application of:	
Christi	an VISKOV et al.	Group Art Unit: 1623
Applica	ation No.: 10/808,410	Examiner: Unassigned
Filed:	March 25, 2004	) )
	METHOD FOR DETERMINING SPECIFIC GROUPS CONSTITUTING HEPARINS OR LOW MOLECULAR WEIGHT HEPARINS	) Confirmation No.: 5338 ) )

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

## **INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97(b)**

Pursuant to 37 C.F.R. §§ 1.56 and 1.97(b), applicants bring to the attention of the Examiner the documents on the attached listing. This Information Disclosure Statement is being filed before the mailing date of a first Office Action on the merits for the above-referenced application.

Copies of the listed foreign and non-patent literature documents are attached.

Copies of the U.S. patent publications are not enclosed.

Applicants respectfully request that the Examiner consider the listed documents and indicate that they were considered by making appropriate notations on the attached form.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claim in the application and applicants determine that the cited documents do not constitute "prior art" under United States law, applicants reserve the right to present to the office the relevant facts and law regarding the appropriate status of such documents.

Applicants further reserve the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: November 21, 2005

Lauren L. Stevens

Reg. No. 36,691

ي			IPE			
IDS Form PTO/S	SB/08: Substitute for for	m 1449A/PTO	743		omplete if Known	
		( NO	V 2 1 2005	Application Number	10/808,410	
INF	ORMATION D	Jeel Acti	DE À	¥IFiling Date	March 25, 2004	
ST/	ATEMENT BY	ADDI VAA	NT JO	First Named Inventor	Christian VISKOV	
317	VIEWENI DI	VLL FIGN	TRADENAR	Art Unit	1623	
	(Use as many sheets	as necessary)		Examiner Name	Unassigned	
Sheet	1	of	2	Attorney Docket Number	03806.0586	

U.S. PATENTS AND PUBLISHED U.S. PATENT APPLICATIONS					
Examiner	Cite	Document Number	Issue or	Name of Patentee or	Pages, Columns, Lines, Where
Initials	No.¹	Number-Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Applicant of Cited Document	Relevant Passages or Relevant Figures Appear
		US-2002/0055621 A1	05/09/2002	Diaz et al.	
		US-2004/0265943 A1	12/30/2004	Viskov et al.	
		US-2005/0119477 A1	06/02/2005	Mourier et al.	

Note: Submission of copies of U.S. Patents and published U.S. Patent Applications is not required.

	FOREIGN PATENT DOCUMENTS					
Examiner Initials	Cite No.1	Foreign Patent Document  Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	Translation <sup>6</sup>
		WO 01/29055 A2	04/26/2001	Aventis Pharma S.A.		Abstract
		WO 01/72762 A1	10/04/2001	Aventis Pharma S.A.	-	Abstract

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	Translation
		Abdel-Malik, M. et al., "Nuclear Magnetic Resonance Spectra of Some 2,3-AN-Hydropyranose Derivatives," <i>Carbohydrate Research</i> , Vol. 159, pp. 11-23 (1987).	
		Desai, U. R. et al., "Substrate Specificity of the Heparin Lyases from Flavobacterium heparinum," Archives of Biochemistry and Biophysics, Vol. 306, No. 2, pp. 461-468 (1993).	
		Desai, U. R. et al., "Structure Elucidation of a Novel Acidic Tetrasaccharide and Hexasaccharide Derived from a Chemically Modified Heparin," <i>Carbohydrate Research</i> , Vol. 241, pp. 249-259 (1993).	-
		Ernst, S. et al., "Enzymatic Degradation of Glycosaminoglycans," Critical Reviews in Biochemistry and Molecular Biology, Vol. 30, No. 5, pp. 387-444 (1995).	
		Guerrini, Marco et al., "A Novel Computational Approach to Integrate NMR Spectroscopy and Capillary Electrophoresis for Structure Assignment of Heparin and Heparin Sulfate Oligosaccharides," <i>Glycobiology</i> , Vol. 12, No. 11, pp. 713-719 (2002).	
		Huber, L., "Optimization of Diode Array Detection for Sensitivity, Selectivity, Wavelength Resolution, and Linearity," <i>Chromatographic Science Series</i> , Vol. 62, pp. 363-392 (1993).	
		Ito, K., et al., "Ion Chromatography of Inorganic Iodine Species Using C <sub>18</sub> Reversed-Phase Columns Coated with Cetyltrimethylammonium," <i>Journal of Chromatography</i> , Vol. 549, pp. 265-272 (1991).	
		Ito, K. et al., "Anion Chromatography Using Octadecylsilane Reversed-Phase Columns Coated with Cetyltrimethylammonium and Its Application to Nitrite and Nitrate in Seawater," <i>Anal. Chem.</i> , Vol. 63, pp. 273-276 (1991).	
		Ito, K. et al., "Determination of Inorganic Anions in Salt Solutions by Ion Chromatography Using C <sub>18</sub> Reversed-Phase Columns Coated with Cetyltrimethylammonium," <i>Journal of Chromatography</i> , Vol. 598, pp. 237-241 (1992).	
		Jasea, M. et al., "Novel Regio-and Stereoselective Modifications of Heparin in Alkaline solution. Nuclear Magnetic Resonance Spectroscopic Evidence," <i>Canadian Journal of Chemistry</i> , Vol. 67, No. 9, pp. 1449-1456 (1989).	
		Karamanos, N. K. et al., "Ion-pair High-Performance Liquid Chromatography for Determining Disaccharide Composition in Heparin and Heparin Sulphate," <i>Journal of Chromatography A</i> , Vol. 765, pp. 169-179 (1997).	
		Kariya, Y. et al., "Disaccharide Analysis of Heparin and Heparan Sulfate Using Deaminative Cleavage with Nitrous Acid and Subsequent Labeling with Paranitrophenyl Hydrazine," J. Biochem., Vol. 123, pp. 240-246 (1998).	
		Kusche, M. et al., "Biosynthesis of Heparin: Availability of Glucosamionyl 3-O-Sulfation Sites," <i>The Journal of Biological Chemistry</i> , Vol. 265, No. 13, pp. 7292-7300 (1990).	
		Linhardt, R. J. et al., "Production and Chemical Processing of Low Molecular Weight Heparins," Seminars in	

١	•

NON PATENT LITERATURE DOCUMENTS	
Thrombosis and Hemostatis, Vol. 25, Supp. 3, pp. 5-16 (1999).	
Lindhardt, R. J. et al., "Analysis of the Structure of Heparin and Heparan Sulfate by High-Resolution Separation of Oligosaccharides," in <i>BioMethods</i> , Vol. 9, "A Laboratory Guide to Glycoconjugate Analysis," pp. 183-197 (1997).	
Mochizuki, H. et al., "Characterization of a Heparan Sulfate 3-O-Sulfotransferase-5, an Enzyme Synthesizing a Tetrasulfated Disaccharide," <i>The Journal of Biological Chemistry</i> , Vol. 278, No. 29, pp. 26780-26787 (2003).	
Moffat, C. F. et al., "Heparinase II from <i>Flavobacterium Heparinum</i> : Action on Chemically Modified Heparins," <i>Eur. J. Biochem.</i> , Vol. 197, pp. 449-459 (1991).	
Piani, S. et al., "Alkali-Induced Optical Rotation Changes in Heparins and Heparan Sulfates, and Their Relation to Iduronic Acid-Containing Sequences, <i>J. Carbohydrate Chemistry</i> , Vol. 12, Nos. 4&5, pp. 507-521 (1993).	
Raman, R. et al., "The Heparin/Heparan sulfate 2-O-Sulfatase from Flavobacterium heparinum, The Journal of Biological Chemistry, Vol. 278, No. 14, pp. 12167-12174 (2003).	
Rej, R. N. et al., "Base-Catalyzed Conversion of the α-L-Iduronic Acid 2-Sulfate Unit of Heparin into a Unit of α-L-galacturonic Acid, and Related Reactions," <i>Carbohydrate Research</i> , Vol. 200, pp. 437-447 (1990).	
Rhomberg, A. J. et al., "Mass Spectrometric and Capillary Electrophoretic Investigation of the Enzymatic Degradation of Heparin-Like Glycosaminoglycans," <i>Pro. Natl. Acad. Sci. USA</i> , Vol. 95, pp. 4176-4181 (1998).	
Sakaguchi, H. et al., "Isolation of Reducing Oligosaccharide Chains From the Chondroitin/Dermatan Sulfate—Protein Linkage Region and Preparation of Analytical Probes by Fluorescent Labeling with 2-Aminobenzamide, J. Biochem, Vol. 129, pp. 107-118 (2001).,	
Sturiale, L. et al., "MALDI Mass Spectrometry as a Tool for Characterizing Glycosamoinoglycan Oligosaccharides and Their Interaction with Proteins," Seminars in Thrombosis and Hemostasis, Vol. 27, No. 5, pp. 465-472 (2001).	
Sagahara, K. et al., "Structure Determination of the Octa- and Decasaccharide Sequences Isolated from the Carbohydrate-Protein Linkage Region of Porcine Intestinal Heparin," <i>J. Biol. Chemistry</i> , Vol. 270, No. 39, pp. 22914-22923 (1995).	
Sugahara, K. et al., "A Novel Sulfated Structure in the carbohydrate-Protein Linkage Region Isolated from Porcine Intestinal Heparin," <i>The Journal of Biological Chemistry</i> , Vol. 267, No. 3, pp. 1528-1533 (1992).	
Thanawiroon, C. et al., "Separation of a Complex Mixture of Heparin-Derived Oligosaccharides Using Reversed-Phase High-Performance Liquid chromatography," <i>Journal of Chromatography A</i> , Vol. 1014, pp. 215-223 (2003).	
Toida, T. et al., "C-2 Epimerization of <i>N-Acetylglucosamine</i> in an Oligosaccharide Derived from Heparin Sulfate," <i>J. Carbohydrate Chemistry</i> , Vol. 15, No. 3, pp. 351-360 (1996).	
Venkataraman, G. et al., "Sequencing Complex Polysaccharides," Science, Vol. 286, pp. 537-542 (1999).	
Yamada, s. et al., "Structural Studies on the Bacterial Lyase-Resistant Tetrasaccharides Derived from the Antithrombin III-Binding Site of Porcine Intestinal Heparin," <i>The Journal of Biological Chemistry</i> , Vol. 268, No. 7, pp. 4780-4787 (1993).	
Yamada, s. et al., "Isolation of the Porcine Heparin Tetrasaccharides with Glucuronate 2-O-Sulfate," The Journal of Biological Chemistry, Vol. 270, No. 15, pp. 8696-8705 (1995).	

Examiner	Date	
Signature	Considered	

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.